

DISCUSSION DRAFT
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An Organizing Framework for Wilderness Values*

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Introduction

Scientists, philosophers, poets and politicians have defined wilderness in various physical and metaphysical terms. Following a metaphysical line of thought, wilderness has been described as a subjective “idea” in the mind of the beholder (Oelschlaeger, 1991). The Wilderness Act uses many physical terms to define statutory wilderness as a land area “without permanent improvements or human habitation”, “which generally appears to have been affected primarily by the forces of nature” and “has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition” (Wilderness Act, 1964). Thus, according to the Wilderness Act, statutory wilderness is clearly a physical place and not just a metaphysical idea.

Capturing both the physical and metaphysical perspectives, Aplet defines wilderness as “a place where an idea is clearly expressed: the idea of wilderness” (Aplet, 1999). The subjective idea of wilderness is also reflected in the language of The Wilderness Act which indicates that wilderness is a place “retaining its primeval character and influence”, where “man himself is a visitor who does not remain” and which has “outstanding opportunities for solitude or a primitive and unconfined type of recreation” (Wilderness Act, 1964). Subjective characteristics such as “primeval character”, “solitude” or “primitive recreation” may be experienced by different people in different places ranging from a city park to the Alaska tundra.

In this paper, we are concerned with identifying the types of values that wilderness provides as a place and an idea. As a point of departure, we are content to rely on the definition of wilderness provided by The Wilderness Act since it encompasses both the objective and subjective aspects of wilderness. Hence, when we refer to wilderness in this paper, we mean

statutory or official Wilderness with a big “W” defined by The Wilderness Act. The paper begins by presenting a general organizing framework for identifying and inventorying Wilderness values which combines the ecological model of ecosystem structure, functions and services with scientific and philosophical concepts of value. In subsequent sections of the paper, different types of Wilderness values are discussed in more detail. Connections between Wilderness values and concluding comments are discussed in the final section.

Wilderness Accounts, Attributes, Functions and Services

In June, 2000 a national wilderness value workshop was held in Washington, D.C. A primary objective of this workshop was to develop a cross disciplinary framework for understanding and organizing wilderness values and the various dimensions of these values. Table 1 summarizes the results of the workshop discussions and deliberations between ecologists, economics, sociologists, social-psychologists, philosophers and wilderness planners and policy makers. The framework accounts for the following dimensions of relevance to identifying, assessing and measuring wilderness values: wilderness accounts, wilderness attributes, wilderness functions, wilderness services and wilderness values.

Wilderness Accounts

Four primary accounts for categorizing wilderness values, but not necessarily in a mutually exclusive manner, are the economic, social, ecologic and ethical accounts or categories. The economic account includes anthropocentric values and impacts of wilderness on individuals and communities that can be measured in dollar terms. The social account includes a broad array of anthropocentric values and impacts of wilderness on individuals and communities that cannot be measured in dollar terms. The ecologic account includes biophysical concepts and measures of wilderness ecosystem health and biodiversity. The ethical account includes philosophical concepts

of values and impacts related to fairness, justness and goodness.

Wilderness Attributes

As mentioned above, wilderness is both an idea and a place. As a place, wilderness areas have particular observable attributes or characteristics. These attributes, which are objectively measurable, include geographic area, location, topography, geologic composition, hydrological composition, climate, atmosphere, fauna and flora. One of the first steps towards assessing wilderness values is to inventory wilderness attributes. For this study, a particular need is to inventory the attributes of statutory wilderness designated under The Wilderness Act and included in the National Wilderness Preservation System. This inventory can occur at different scales including assessing the attributes of an individual designated wilderness area, all designated wilderness areas in a region and all designated wilderness in the United States.

Wilderness Functions

The objectively measurable attributes of a person's house such as bedrooms, bathroom facilities, kitchen facilities, office space and recreation and leisure areas support a number of major functions of the house. These functions or fundamental purposes include meeting the basic need of shelter from natural elements (e.g., cold, heat, rain), providing a private recreation and leisure setting and providing a private home office work place. In an analogous manner, the objectively measurable attributes of wilderness areas such as flora and fauna, water storage and flow, and geographic features support a number of major functions. These functions or fundamental purposes include preservation of natural and wild places, provision of recreational and experiential settings, and preservation of ecosystem health and biodiversity.

The Wilderness Act clearly recognizes preservation of natural and wild places as one of the functions or fundamental purposes of wilderness areas. The Act, for example, indicates that a

wilderness area is a place of “primeval character and influence” which is protected and managed “so as to preserve its natural conditions”. In the context of the Wilderness Act, natural conditions or naturalness refers to the presence of plants, animals and physical landscape features that can be found in the planet Earth ecosystems. In an analysis of the nature of *wildness*, Aplet explains that the degree of wildness in a place is a function of naturalness and “freedom from control” (Aplet, 1999). He argues that wilderness is a place with a high degree of wildness where high levels of both naturalness and freedom from human management can be observed and experienced. Naturalness and freedom from control do not necessarily have to coincide. For example, a public park or forest may offer a relatively high degree of naturalness, yet be subject to rather intensive human management. A unique function or fundamental purpose of wilderness recognized by many authors is that it preserves high levels of both naturalness and freedom from human interference or control (Aplet, 1999; Godfrey-Smith, 1979; Hammond, 1985).

The Wilderness Act also clearly recognizes provision of recreational and experiential settings as one of the functions or fundamental purposes of wilderness areas. The Act, for example, states that wilderness is a place with “outstanding opportunities for solitude or a primitive and unconfined type of recreation”. The experience of “solitude” referred to in the Act may or may not be tied to recreational activities. For example, the solitude experience may be a component of a course or program in psychological healing or therapy involving visits to a wilderness area. The function of wilderness as an experiential setting is also indicated in The Wilderness Act passage stating that wilderness areas “may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value”. The unique recreational opportunities and therapeutic, scientific, educational, scenic and historical and cultural experiences supported by wilderness have been addressed by a number of authors (Aplet, 1999;

Godfrey-Smith, 1979; Hammond, 1985; Morton, 1999; Oelschlaeger, 1991, Rolston, 1985).

In recent years, the function or fundamental purpose of wilderness to preserve ecosystem health and biodiversity has gained more attention. The Wilderness Act does not explicitly recognize this function, but it is alluded to in the passage indicating that the ecological features or attributes of wilderness areas may have scientific, educational, scenic, or historical value. The ecological features or attributes of wilderness areas include preservation of healthy, functioning ecosystems and the biodiversity supported by these ecosystems. The preservation of healthy ecosystems including perhaps entire ecosystems within the boundaries of a designated wilderness area provides a storehouse of scientific knowledge, plant and animal preserve and components of regional and global chemical cycles such as hydrologic, carbon and oxygen cycles (Morton, 1999; Noss, 1996; Rolston, 1985).

Wilderness Services

Wilderness services are services to nonhuman and human agents and communities supported by the major functions of wilderness areas, the quantity and quality of which are influenced by wilderness attributes. For example, the function of wilderness areas to provide *recreational and experiential settings* supports services such as personal leisure associated with on-site recreational activities and personal healing associated with on-site therapeutic activities.

Wilderness areas also provide a “cathedral” type setting where people can contemplate the inspirational qualities of wilderness and experience “spiritual revival, moral regeneration and aesthetic delight” (Godfrey-Smith, 1979; Rolston, 1985). The presence of wilderness may also contribute to the overall social well-being and quality of life in human communities through recreational, therapeutic and religious or spiritual activities. The quantity and quality of personal physical, emotional or spiritual growth and community well-being and quality of life supported by

recreational or therapeutic activities are influenced by the attributes of wilderness areas where the activities takes place.

The function of wilderness areas to provide natural and wild places complements the recreational and experiential function of wilderness. Wilderness areas, for example, provide unique primitive camping opportunities and unique cultural and historical experiences associated with seeing and experiencing the American frontier as it once was, for example, before westward expansion from the populated East Coast (Hammond, 1985; Morton, 1999; Rolston, 1985). The wildness found in wilderness characterized by high degrees of both naturalness and freedom from human control also complements the function of wilderness as a recreational and experiential setting supporting personal physical, emotional and spiritual growth, and provides unique opportunities for scientific discovery and educational development through the use of wilderness as a natural, outdoor laboratory and classroom (Aplet, 1999; Godfrey-Smith, 1979; Morton, 1999; Rolston, 1985; Rusell, Hendee and Cooke, 1998). In some areas of the U.S. such as Alaska, the wildness of wilderness may also support subsistence living for native American populations and help to preserve unique native American cultures.

The function of wilderness or preserve ecosystem health and biodiversity complements the other two functions discussed above in the provision of many of the wilderness services listed in Table 1. For example, preservation of ecosystem health and biodiversity greatly enhances the use of wilderness as a natural, outdoor laboratory and classroom. Preservation of ecosystem health and biodiversity may also contribute to personal physical, emotional and spiritual growth through nature-based medicines and personal satisfaction gained from contemplating the existence of well functioning and biologically diverse ecosystems. Healthy ecosystems also complement the preservation of natural and wild places function of wilderness to directly serve nonhuman

biological agents through the provision of animal and plant habitat.

As a component of regional and global chemical cycles, wilderness areas contribute to ecological services such as carbon sequestration. Ecological services have the potential to affect living organisms over broad geographic and temporal scales. For example, to the extent that carbon sequestration helps to regulate global climate, the carbon stored in or released from wilderness areas may have both regional and global life-support consequences in the short and long-run (Costanza and Daly, 1992; Costanza et al, 1997; England, 2000).

Wilderness Values

Wilderness areas are part of the natural capital of a region or landscape (Morton, 1999). Natural capital is an asset composed of objectively measurable attributes (such as flora, fauna and geographic features) that fit and operate together to provide major functions (such as chemical cycling). The major functions of natural capital provide asset services to people and all other living organisms such as oxygen to breath and water to drink. Like other forms of capital assets (e.g., financial, constructed and human capital), if the attributes and functions of the capital asset are protected and maintained, asset services can be provided on a sustainable basis, unless the service involves depletion of a fixed stock (e.g., crude oil extraction). In the case of wilderness areas, most natural capital services are derived from renewable resources and therefore are in the nature of sustainable asset flows (Cleveland, 1994; Costanza and Daly, 1992; England, 2000; Morton, 1999).

Natural capital services provide individuals and society with a broad array of values or benefits. Human, animal and plant health benefits, for example, are often cited as major reasons for protecting and maintaining ecological services such as chemical cycling which are dependent upon natural capital (Costanza et al, 1997; Daly and Cobb, 1994; England, 2000). As a

specialized form of natural capital, the attributes and functions of designated wilderness areas as defined by The Wilderness Act provide a unique set of services illustrated in Table 1. These designated wilderness services support a unique set of values or benefits. These values can be organized into the four accounts or categories shown in Table 1; social, economic, ecologic and ethical.

As illustrated in Table 1, each of the four major value accounts has a number of sub-accounts reflecting specific types of value measures or indicators. Under the social account, sub-accounts include psychological values, sociological values and anthropological values. Under the economic account, sub-accounts include active use values, passive use values and economic impacts. Ecologic sub-accounts include human life support indicators and animal and plant life support indicators, and ethical sub-accounts include instrumental values and intrinsic values.

The wilderness value accounts and sub-accounts shown in Table 1 are not necessarily mutually exclusive as more than one discipline may have a perspective on how to assess a particular type of wilderness value. For example, consider the concept of existence value. Existence value for, say, an endangered bird may be broadly defined as the value of its continued existence beyond active use by people. The existence value of the bird, as defined broadly here, could be assessed under each of the four major value accounts shown in Table 1.

Under the social account, the bird's continued existence may provide specific psychological or sociological values to particular individuals or cultures that cannot be quantified in monetary terms. Under the economic account, existence value of the bird is a specific type of passive use value and would be defined as the economic value (e.g., willingness-to-pay) that an individual places on continued existence of the bird beyond economic values associated with active use in the present or future (e.g., present or future bird-watching activities). Under the

ecologic account, continued existence of the bird may be an important indicator of overall ecosystem health and biodiversity needed to support both human and nonhuman life.

Under the ethical account, continued existence of the bird would have both instrumental and intrinsic values. An example of an instrumental value is the value of the bird as an input into generating happiness in a person who enjoys viewing the bird in the field or in pictures.

Instrumental values obviously overlap with social and economic values. Intrinsic values of the bird include values of the bird beyond human active or passive use. That is, philosophically, the intrinsic value of the bird is the value that exists even in the absence of people.

Table 1 provides an organizing framework for wilderness values that recognizes the functional linkages and connections between wilderness attributes, functions, services and values.

Wilderness attributes support wilderness functions, wilderness functions support wilderness services, and wilderness services support wilderness values in a holistic manner. Thus, it is difficult if not impossible to separate out the contributions of wilderness attributes, functions and services to specific types of wilderness values such as existence value.

To facilitate assessment of wilderness values, a matrix of specific types of wilderness values by major accounts is presented in Table 2. The inventory of values listed in Table 2 are based on discussions at the National Wilderness Values Workshop in June, 2000 and previous literature (Aplet, 1999; Bergstrom and Loomis, 1999; Godfrey-Smith, 1979; Loomis and Richardson; Morton, 1999; Rolston, 1985; Rusell, Hendee and Cooke, 1998). The set of wilderness attributes, functions and services that support the values shown in Table 2 are embedded in these values and the table. The values listed in Table 2, for example, may represent values of one designated wilderness area in some part of the United States, say the Bob Marshall Wilderness in Montana. In this case, the wilderness attributes, functions and services of the Bob

Marshall wilderness would be embedded in the various specific types of values of the Bob Marshall illustrated in Table 2.

Table 2 shows that each specific type of wilderness value can be viewed from social, economic, ecologic or ethical perspectives or “windows”.¹ Some values, such as existence value, cut across all value accounts or perspectives as discussed above. Other values may be limited to subsets of the four major value accounts. For each type of value listed in Table 2, the overall goal of this project is to assess the current state of knowledge of each value from social, economic, ecologic and ethical perspectives including measures or indicators. We are specifically interested in the set of baseline values supported by the current National Wilderness Preservation System composed of current legislatively designated wilderness area and policies and regulations governing management of these wilderness areas.

¹ The format of Table 2 and the concept of different valuation accounts or perspectives providing different “windows” from which resource and environmental values can be viewed is gratefully credited to John Loomis at Colorado State University.

References Cited

- Aplet, G.H. "On the Nature of Wildness: Exploring What Wilderness Really Protects", *Denver University Law Review*. 76 (1999):347-367.
- Ayres, R.U. "Limits to Growth Paradigm", *Ecological Economics*, 19 (1996):117-134.
- Bergstrom, J.C. and J.B. Loomis. "Economic Dimensions of Ecosystem Management", Chapter 11 in Cordell H.K. and J.C. Bergstrom (Editors), Integrating Social Sciences with Ecosystem Management. Champaign, IL: Sagamore Press (1999).
- Cleveland, C.J. "Reallocating Work Between Human and Natural Capital in Agriculture: Examples from India and the United States", in Jansson, A.M. et al. (Editors), Investing in Natural Capital. Washington: Island Press (1994).
- Costanza, R. and H.E. Daly. "Natural Capital and Sustainable Development", *Conservation Biology*, 6 (1992):37-46.
- Constanza, R. et al., "The Value of World's Ecosystem Services and Natural Capital", *Nature*, 387 (1997):253-260.
- Daly, H.E. and J. Cobb, Jr. For the Common Good. Boston: Beacon Press (1996).
- England, R.W. "Natural Capital and the Theory of Economic Growth", *Ecological Economics*, 34 (2000):425-431.
- Godfrey-Smith, W. "The Value of Wilderness", *Environmental Ethics*. Winter (1979):309-319.
- Hammond, J.L. "Wilderness and Heritage Values", *Environmental Ethics*, Summer (1985): 165-170.
- Loomis, J.B. and R. Richardson. Economic Values of Wilderness in the United States.
- Morton, P. "The Economic Benefits of Wilderness: Theory and Practice", *Denver University Law Review*. 76 (1999):465-518.
- Noss, R. F. "Soul of the Wilderness", *International Journal of Wilderness*, August (1996):3-8.
- Oelschlaeger, M. The Idea of Wilderness: From Prehistory to the Age of Ecology. New Haven: Yale University Press (1991).
- Rolston, H. "Valuing Wildlands", *Environmental Ethics*, Spring (1985):23-48.
- Russell, K., J.C. Hendee and S. Cooke. "Social and Economic Benefits of a U.S. Wilderness Experience Program for Youth-at-Risk in the Federal Job Corps", *International Journal of Wilderness*, December (1998):2-8.

Table 1. An Organizing Framework for Wilderness Values

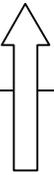
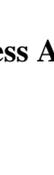
Basic Functional Connections	Measurement Accounts or Categories	Specific Types of Measures or Indicators
<p style="text-align: center;">Wilderness Values</p> 	Social	Psychological Value Sociological Value Anthropological Value
	Economic	Active Use Value Passive Use Value Economic Impacts
	Ecologic	Human Life Support Value Animal and Plant Life Support
	Ethical	Instrumental Value Intrinsic Value
<p style="text-align: center;">Wilderness Services</p> 	Animal and Plant Habitat	
	Carbon Sequestration	
	Subsistence Living	
	Cultural Preservation	
	Historic Preservation	
	Scientific Discovery	
	Educational Development	
	Personal Physical Health and Growth	
	Personal Emotional Health and Growth	
	Personal Spiritual Health and Growth	
<p style="text-align: center;">Wilderness Functions</p> 	Preservation of Natural and Wild Places	
	Recreational and Experiential Setting	
	Ecosystem and Biodiversity Preserve	
<p style="text-align: center;">Wilderness Attributes</p> 	Geographic	
	Geologic	
	Hydrologic	
	Atmospheric	
	Biologic	
	Naturalness	
	Wildness Constructed	

Table 2. Wilderness Values Matrix

Values	Accounts			
	Social	Economic	Ecologic	Ethical
On-site recreational				
On-site scientific				
On-site educational				
On-site cultural				
On-site historical				
On-site therapeutic				
On-site aesthetic				
On-site spiritual				
Off-site recreational				
Off-site scientific				
Off-site educational				
Off-site cultural				
Off-site historical				
Off-site therapeutic				
Off-site aesthetic				
Off-site spiritual				
Subsistence				
Existence				
Intrinsic				
Energy flow				
Chemical flow				
Gene pool				
Carbon storage				
Water storage				
Waste treatment				